



WATER SUPPLY SYSTEM MANAGEMENT PLAN EXECUTIVE SUMMARY

KINGSTON CAMPUS

Revised 2018

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Executive Summary

Introduction

This planning document was prepared to comply with the requirements of the Water Supply System Management Planning Act and the Rules and Regulations for the Water Supply System Management Planning, October 2002 as promulgated by the Rhode Island Water Resource Board. This plan serves as a guide in the decision making process for the long term planning of the water supply utility serving the University.

Background

The University of Rhode Island's primary goal is to operate an educational institution of higher learning. The University operates a water system for the benefit of and to meet the legitimate needs of the students, faculty, and staff of the University. The water system was installed around 1900, shortly after the start of the University, and has expanded over the years to meet the demands of the University.

General System Description

Sources

The water system is supplied by three gravel pack wells located in the Chipuxet Aquifer. These wells were installed between 1949 and 1974 and have seen various upgrades over the years to ensure reliability. Current total pump capacity is 2.5 MGD or 2300 gpm with well capacity capable of 28.1 MGD.

Treatment

In June, 2000 the University began treatment for corrosion control and ph adjustment by adding hydrated lime to its water system. In 2010 the University voluntarily installed hypo-chlorination. A supervisory control and data acquisition (SCADA) system continuously monitors water quality and control of system operation.

Distribution and Storage

The distribution system is composed of approximately 15 miles of pipe. Ninety percent of the pipe is less than 50 years old and constructed of lined ductile iron pipe. Water is stored in a 1 million gallon elevated storage tank. This tank is scheduled for painting in 2018.

Interconnections

The University maintains three interconnections with Kingston Water District for emergency supply. Details of these connections are in the main report.

Population and Projections

The boundaries of the service area include approximately 1,200 acres of area. The current water system serves a population of 19,354 during the academic school year. In the five year planning horizon we project construction of a new 500 bed dormitory and adding approximately 270,000 square feet. This equates to an increase in our annual demand of 17.5 million gallons per year. Beyond this construction the twenty year planning horizon sees numerous renovations of existing buildings that do not substantially add square footage, so any increase in demand is negligible.

Water Use

URIKC-Water provides service to the university for all water needs including, residential, academic, research, irrigation and operations. On average the university supplies approximately 0.377 MGD. This average has decreased from a peak of 0.491 MGD over the past 15 years while the university has added substantially to the student body and building square footage.

Peak daily demand can reach 0.669 MGD, typically in September. The university is the only customer and the largest user is the boiler plant. The boiler plant can consume up to twenty percent of daily production, but average annual consumption is about eight percent. The URIKC-Water service area is limited to the Kingston campus of the university and surrounding area owned by the university and used for support and other facilities of the university. The boundaries of the service area include approximately 1,200 acres of area.

URI has a comprehensive campus wide conservation program where cost savings are used to fund additional improvements. This program has made vast improvements to URI's steam distribution system that has reduced make-up water demand. URIKC-Water regularly performs leak surveys, estimates un-accounted for water and conducts leak surveys if un-accounted for water exceeds 10%. Water use has decreased nearly 10% over the past ten years while at the same time the campus has added 500 beds and 425,000 square feet of academic space.

Metering

Each production well is equipped with a venturi style water meter. These meters are continuously monitored and operators log daily measurements as well. The University supplies water only to itself. As the campus grew and buildings were

added, water meters were not installed. Starting in 2004 most new buildings included water meters in the design. As part of the University's Demand Management Strategy that was approved by the Water Resource Board staff in 2014, the University reads existing meters quarterly and uses these figures to estimate water use in non-metered buildings. The university then calculates non-accounted water. URI requires water meters in all new construction and significant building renovations.

Non-Account Water

Non-accounted water is estimated from reading meters in existing buildings and calculating water use per bed or per square foot. These factors are then applied to non-metered buildings and water use is estimated by totaling water use for various user classes. Total estimated customer consumption is then compared to well production to determine non-accounted water.

Demand Management

URIKC-Water has been active in utilizing various elements of demand management to encourage efficient use of water. Our 2015 average per capita usage was 20 gallons/person/day. We review quarterly meter readings and investigate buildings with abnormal use. URIKC is implementing the following actions to improve the efficient use of water:

- Assess the end use fixtures in all buildings
- Identify improvement actions for fixture replacement/upgrading
- Reduce/eliminate once through water use fixtures/equipment for air-conditioning, food preparation, etc.
- Improve boiler plant condensate return efficiency,
- Irrigation control using sensors and/or timers and
- Public education program to educate freshmen on conservation.

URIKC-Water monitors daily, monthly and annual water production and calculates water use for each building quarterly in accordance to the approved Demand Management Strategy. This information is then used to calculate unaccounted for water.

URIKC-Water performs triennial leak detection surveys to ensure water efficiency. Furthermore, if annual unaccounted water is greater than 10% a leak survey will be conducted in accordance with AWWA Manual 36.

Supply and Demand Management

URI has taken active measures to protect its water supply wells and monitor and mitigate future contaminants of concern. Improvements to infrastructure and conservation measures has reduced annual demand below 1968 levels when the campus population was half what it is today. Current per capita usage is 20

gallons per day per person.

Available Water and Alternative Supplies

The existing three wells that serve the university can pump 2.5 MGD or 912 MG per year. At the present time, URIKC-Water considers its current sources to be sufficient to meet future demands for the planning periods noted above. However, URIKC-Water recognizes that its current wells are located down gradient of campus, and that there is moderate risk to groundwater contamination from campus activities. As a result, URIKC-Water is seeking an alternate well site from the Rhode Island Water Resource Board located on Wolf Rock Road in Exeter, RI. This site draws from the Chipuxet aquifer but up stream of the university.

Kingston Water District draws from the Chipuxet aquifer from three shallow wells located downstream from the university. The university maintains three interconnections with KWD. KWD notes that they could provide water to the university on a long term basis, but upgrades to their treatment systems would be necessary.

Anticipated Future Demands

Current annual demand is 137 MG. Based upon information from Campus Planning and Design, URIKC-Water expects water annual demand to increase to 156 MG by 2023 and 161 MG by 2034 or an increase of existing demand of approximately 64,109 gallons/day. Much of this added demand will occur in the next five years with the addition of a new 500 bed dormitory and expansion of existing buildings. URI will continue to make infrastructure improvements and conservation efforts to ensure system resiliency and efficiency.

Supply Augmentation Studies

The university has been actively pursuing improvement to its existing supply wells including well rehabilitation, well redevelopment, new pumps and motors, new well stations, treatment system improvements, and installation of well field piping to allow blending and treatment of all sources. URIKC-Water maintains a library of reports and publications on the Chipuxet Aquifer that are used to support design and operation of the supply wells.

The university is seeking alternate remote well fields that could supply the university in the event the existing well field is contaminated. Lastly, URIKC-Water maintains three interconnections with Kingston Water District that can supply water to meet the demands of the university. Kingston Water District is pursuing interconnection with Suez of Wakefield that is interconnected with utilities that are supplied from outside the Chipuxet Aquifer.

Water Quality Protection

URIKC-Water has developed a comprehensive Wellhead Protection Program to protect and maintain water quality. This plan targets and tracks emerging contaminants, develops construction standards and development restrictions within the wellhead protection area, develops road salt and fertilizer management programs, targets land for purchase or protection and coordinates with URI Planning and the Town of South Kingstown Planning Department. URIKC-Water has also developed a Groundwater Protection Policy that is currently being incorporated into the Campus Master Plan.

System Management

Water is critical to the university achieving its educational mission. As a result the university provides the necessary resources to ensure the water system is resilient, compliant with state and federal requirements and is effectively operated and maintained. URIKC-Water performs proactive planning, maintenance and operational programs to ensure interruption-free service to the system users. URIKC-Water maintains an inventory of replacement parts and contracts for emergency service to make any necessary repairs.

Emergency Management

URIKC-Water maintains an Emergency Response Plan that identifies and provides critical system personnel and emergency contacts, critical system information, damage assessment and response procedures and various forms for logging information during an emergency. This plan is prepared to be an operational guide during an emergency and is updated annually.

Drought Management

The University, because of the academic calendar, requires 30% less water during the summer periods of a year when drought conditions would be most severe. Nevertheless, URIKC-Water monitors drought conditions and has established triggers that implement drought management strategies. Management strategies include adjustments to well pumping rates and cycles, issuing drought advisories and restrictions, restricting water use, RESTRICTING irrigation and vehicle washing.

Financial Management

URIKC-Water operates as an organizational element of the Department of Business Services of the University of Rhode Island. All operations of URIKC-Water are financed from the operational budget of the University of Rhode Island. No specific charges or user fees are levied to users of the water system. The

budget for the water system is prepared to incorporate all the costs of operations and maintenance.

Coordination

Facilities Services is involved in the planning for the University's growth. URIKC-Water has updated its wellhead protection plan and working to incorporate this plan in the University Master Plan. Implementation of this plan involves the University, Town of South Kingstown, Town of Exeter, the Water Resource Board and local organizations and land holders. The University works with these entities as needed to ensure the protection and viability of the Chipuxet Aquifer.